REMARKS

Examiner Kidest Bahta and Applicants' attorney, John J. Connors, had a telephone interview on September 23, 2004, in which Ms. Bahta said, although the Office Action of August 23, 2004 was designated as a FINAL action, this was not the case in view of the newly cited reference. Consequently, no appeal is lodged at this time in anticipation that this response will place the above-identified application in a condition for allowance. If not, then the next office action is expected to be a FINAL action, from which the Applicants may appeal.

The newly cited art of Rubbert et al U. S. Patent No. 6,648,640 (herein Ruppert et al) has a filing date of April 13, 2001, whereas the Applicants' above-identified application has a filing date of September 6, 2000. The Ruppert et al is a continuation-in-part application, but the Examiner has not cited any of the parent applications that matured into a patent as a reference. It would be speculation to assume that these unpublished parent applications contain any disclosure similar to the sections of Ruppert et al on which the Examiner relies to reject Claims 1 through 14 now under consideration. Applicants do not anticipate that the disclosure in Ruppert et al relied upon the Examiner in rejecting the claims was included in the prior Ruppert et al parent applications. Therefore, Ruppert et al should be withdrawn as a reference since it is not prior art under 35 U.S.C. 102(e).

Notwithstanding that Ruppert et al should be withdrawn as a prior art reference, Applicants do not believe that Ruppert et al teaches or suggests their invention for the following reasons:

Ruppert et al relates to the manufacture of an orthodontic appliance, that is braces to straighten teeth. Applicant's invention is directed to making a "...pattern of a dental prosthesis..." or a "...dental prosthesis... from this ...pattern..." Ruppert et al does, however, discuss other applications of their technology and state in Columns 55 and 56:

> The concept of virtual template tooth objects and user manipulation of tooth objects on a computer can also be used in the field of dentures. Traditionally, an impression is taken of the gums and associated bony alveolar structures and these anatomical structures are cast in plastic or wax. Pre-formed teeth are set into the wax in a desired occlusion. The dentures are cast in acrylic using the lost wax technique. This process can be automated using the scanning methods described herein and using virtual three-dimensional template teeth. First, the gums and associated anatomical structures are scanned and represented as a three-dimensional virtual model on the workstation. Then, virtual template teeth are retrieved from memory. The template teeth are sized up or down as necessary to conform to the archform represented by the virtual model of the gums. The virtual template teeth are then placed on the archform. At this point, a three-dimensional virtual model of the teeth, gums and associated anatomical structures is represented in the workstation memory as a three-dimensional virtual object. This digital object can be exported anywhere, such as to a remote location where dentures are manufactured. From this object, a denture can be manufactured from a variety of techniques, including milling and casting. For example, a stereolithographic physical model of the dentition and/or gums can be made and a denture cast in a mold obtained from the physical model using the lost wax technique.
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> The virtual template teeth can also be used in forensic dentistry, i.e., reconstruction of the identity of a victim from teeth. As an example, a jaw containing some teeth can be scanned as described above and represented as a three-dimensional virtual object. Missing teeth can be reconstructed by importing virtual template teeth and placing them on the virtual object. The virtual template teeth may be based on age or ethnicity if such information is known. Contralateral teeth can be constructed by

using existing scanned teeth as the template tooth and placing the scanned tooth in the contralateral position. Eventually, a complete virtual representation of the dentition can be obtained and viewed on the workstation. The shape of the face of the victim can be reconstructed by adding template virtual objects comprising soft tissue, gums, lips, cheeks, skin, hair, etc., and modifying the template objects using navigational tools based on the three-dimensional object or other information known about the victim.

Another example of using template teeth is for purposes of diagnosis and detection of tooth wearing, e.g., due to bruxism. In this example, the original scan taken of the patient is converted into a three-dimensional virtual model. The individual teeth are optically separated into virtual three-dimensional tooth objects as described above. Either this original virtual model of the entire dentition or the set of virtual three-dimensional tooth objects can be considered as a template. Over the course of time, the dentition is scanned again periodically and converted into a three-dimensional virtual model as described above. The individual teeth (or the dentition as a whole) is compared to the template to identify differences due to wearing of teeth. This can be performed by overlaying the two models, each in a different color or tones, and visually detecting where tooth surfaces were present initially but are not present in the current virtual model. Alternatively, measuring tools can be provided on the user interface to measure the height of the tooth or other distances that may be indicative of wear, and numerical values immediately presented to the user on the user interface. These measurements can be compared with measurements made of the template. Now, tooth wear can be quantified precisely.

As yet another possibility, individual tooth objects are obtained from the original scan of the patient. These tooth objects are stored in the memory. In the case of a loss of the patient's tooth due to an accident or due to an extraction, the virtual tooth objects provide a precise template for manufacture of a replacement tooth. The replacement tooth could be manufactured for example using the stereolithograpy and lost wax techniques referred to above.

To sum up, Ruppert et al using scanning techniques creates a computer model of the patient dentition for making an orthodontic appliance or a dental prosthesis. Ruppert et al, however, fail to teach or suggest the specific step of "... transmitting said three dimensional digital data of said dental prosthesis to be manufactured to automated prototyping equipment..." and "...using the automated prototyping equipment making from a wax material the pattern of said dental

prosthesis to be manufactured based upon said three dimensional digital data of said dental prosthesis..." This is because Ruppert et al do not anticipate making a pattern of the dental prosthesis.

Applicants recognize that directly making the dental prosthesis from the three dimensional digital data (the model) of the dental prosthesis using automated prototyping equipment is undesirable. Instead, their invention calls for using the automated prototyping equipment to make a pattern of the dental prosthesis. This pattern is then used in the loss wax process. This is counterintuitive, especially since the prior art in general, and Ruppert et al specifically, calls for making the dental prosthesis directly from the model and avoids altogether the intermediate step of creating a pattern of the dental prosthesis. It is this counterintuitive, non-obvious step that distinguishes Applicants' invention from the prior art.

In view of the above, the application is deemed to be in a condition for allowance and such action is solicited.

TELEPHONE INTERVIEW

If the Examiner believes that a telephone interview would advance the allowance of this application, Applicant's attorney requests the Examiner call to arrange a date and time for such interview after having an opportunity to review the above amendments and consider the above remarks.